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Leu Pro Met Ala Gly Tyr Val Ala Lys Asp Gly Asn Gly Ser Val Gln
145 150 155 160

Glu Ser Glu Lys Ala Pro Ser Ala Arg Trp Asn Glu Val Val Asn Ala
165 170 175

Lys Asn Ala Pro Phe Gln Leu Gln Pro Asp Leu Lys Asp Asn Gln Val
180 185 190

Tyr Ala Asp Glu Phe Val Asn Phe Leu Val Lys Lys Tyr Gly Val Ala
195 200 205

Ser Thr Lys Thr Gly Val Lys Gly Tyr Ser Leu Asp Asn Glu Pro Ala
210 215 220

Leu Trp Ser His Thr His Pro Arg Ile His Gly Glu Lys Val Gly Ala
225 230 235 240

Lys Glu Leu Val Asp Arg Ser Val Ser Leu Ser Lys Ala Ala Lys Ala
245 250 255

Val Asp Ala Gly Ala Glu Ile Phe Gly Pro Val Leu Tyr Gly Phe Gly
260 265 270

Ala Tyr Lys Asp Leu Gln Thr Ala Pro Asp Trp Asn Ser Val Lys Gly
275 280 285

Asn Tyr Ser Trp Phe Val Asp Tyr Tyr Leu Asp Gln Met Arg Leu Ser
290 295 300

Ser Gln Ala Glu Gly Lys Arg Leu Leu Asp Val Phe Asp Val His Trp
305 310 315 320

Tyr Pro Glu Ala Met Gly Gly Gly Ile Arg Ile Thr Asn Glu Val Gly
325 330 335

Asn Asp Glu Thr Lys Lys Ala Arg Met Gln Ala Pro Arg Thr Leu Trp
340 345 350

Asp Pro Thr Tyr Lys Glu Asp Ser Trp Ile Ala Gln Trp Asn Ser Glu
355 360 365

Phe Leu Pro Leu Leu Pro Arg Leu Lys Gln Ser Val Asp Lys Tyr Tyr
370 375 380

Pro Gly Thr Lys Leu Ala Leu Thr Glu Tyr Ser Tyr Gly Gly Glu Asn
385 390 395 400

Asp Ile Ser Gly Gly Ile Ala Met Ala Asp Val Leu Gly Ile Leu Gly
405 410 415

Lys Asn Asp Val Tyr Met Ala Asn Tyr Trp Lys Leu Lys Asp Gly Ala
 420 425 430
 Asn Asn Tyr Val Ser Ala Ala Tyr Lys Leu Tyr Arg Asn Tyr Asp Gly
 435 440 445
 Lys Ser Ser Thr Phe Gly Asp Ile Ser Val His Ala Gln Thr Ser Asp
 450 455 460
 Ile Val Asn Ser Ser Val His Ala Ser Val Thr Asp Ala Ser Tyr Lys
 465 470 475 480
 Glu Leu His Leu Val Val Met Asn Lys Ser Met Asp Ser Ala Phe Asp
 485 490 495
 Ala Gln Phe Asp Leu Ser Gly Glu Thr Thr Tyr Gly Ser Gly Lys Val
 500 505 510
 Trp Gly Phe Asp Lys Asn Ser Ser Gln Ile Lys Glu Ala Ala Pro Ile
 515 520 525
 Thr Gln Ile Ser Gly Asn Arg Phe Thr Tyr Thr Val Pro Pro Leu Thr
 530 535 540
 Ala Tyr His Ile Val Leu Thr Ala Gly Asn Asp Thr Pro Val Glu Asn
 545 550 555 560
 Pro Glu Ser Phe Ala Leu Arg Ala Glu Ala Gly Asp Gly Lys Ser Ile
 565 570 575
 Tyr Leu Asp Ala Ser Ser Gly Val Val Gly Tyr Ser Val Gln Arg Ala
 580 585 590
 Thr Tyr Glu Asn Gly Pro Phe Ala Ala Val Ala Ser Asn Leu Val Glu
 595 600 605
 Thr Ser Tyr Thr Asp Thr Asn Val Thr Asn Gly Thr Ser Tyr Tyr Tyr
 610 615 620
 Lys Ile Thr Ala Lys Thr Lys Thr Gly Thr Ser Ala Ser Asn Val Leu
 625 630 635 640
 Lys Ala Val Pro Arg Ala Pro Val Asp Gly Pro Asp Arg Tyr Glu Ala
 645 650 655
 Glu Asp Gly Thr Leu Lys Gly Thr Val Val Glu Ser Ser Gly Thr Gly
 660 665 670
 Phe Ser Gly Thr Gly Tyr Val Thr Asn Phe His Asn Ala Gly Asp Ser
 675 680 685
 Leu Thr Met Thr Ile Gln Ala Pro Thr Ala Gly Leu Tyr Asn Leu Thr
 690 695 700
 Ile Gly Tyr Arg Ser Pro His Asp Asp Lys Arg Thr Asn Phe Ser Leu
 705 710 715 720

Asn	Gly	Lys	Ala	Ser	Gly	Glu	Leu	Val	Leu	Trp	Lys	Thr	Ala	Asp	Phe		
				725					730					735			
Lys	Glu	Thr	Ser	Gly	Gly	Lys	Val	Leu	Leu	Asn	Ala	Gly	Ala	Asn	Thr		
			740					745					750				
Ile	Gly	Phe	Glu	Thr	Gly	Trp	Gly	Trp	Tyr	Asp	Ile	Asp	Tyr	Val	Lys		
		755					760					765					
Leu	Glu	Pro	Ala	Ala	Asp	Arg	Pro	Pro	His	Ala	Val	Thr	Lys	Thr	Leu		
		770				775					780						
Ile	Asn	Pro	Asn	Ala	Thr	Val	Glu	Ala	Lys	Ala	Leu	Met	Asn	Tyr	Leu		
	785				790					795					800		
Val	Asp	Gln	Tyr	Gly	Lys	Asn	Met	Leu	Ser	Gly	Gln	Glu	Asp	Met	Pro		
				805					810					815			
Glu	Ile	Asp	Trp	Leu	Gln	Ala	Asn	Val	Gly	Lys	Lys	Pro	Ala	Ile	Ala		
			820					825					830				
Ala	Leu	Asp	Leu	Ile	Asp	Tyr	Ser	Pro	Ser	Arg	Ala	Glu	His	Gly	Leu		
		835					840					845					
Ser	Ser	Thr	Glu	Thr	Glu	Lys	Ala	Ile	Glu	Trp	Asp	Lys	Gln	Gly	Gly		
		850				855					860						
Ile	Val	Thr	Phe	Ala	Trp	His	Trp	Asn	Ala	Pro	Lys	Gly	Leu	Ile	Asp		
					870					875					880		
Thr	Gln	Gly	Lys	Glu	Trp	Trp	Arg	Gly	Phe	Tyr	Ala	Asp	Ser	Thr	Thr		
				885					890					895			
Phe	Asp	Ile	Glu	Tyr	Ala	Met	Asn	His	Pro	Glu	Ser	Glu	Asp	Tyr	Lys		
			900					905					910				
Leu	Leu	Ile	Arg	Asp	Ile	Asp	Val	Ile	Ala	Gly	Gln	Leu	Lys	Lys	Leu		
		915					920					925					
Gln	Asp	Ala	Lys	Val	Pro	Val	Leu	Phe	Arg	Pro	Leu	His	Glu	Ala	Glu		
		930				935					940						
Gly	Lys	Trp	Phe	Trp	Trp	Gly	Ala	Lys	Gly	Pro	Glu	Pro	Val	Lys	Lys		
	945				950					955					960		
Leu	Tyr	Ile	Leu	Met	His	Asp	Arg	Leu	Thr	Asn	Val	His	Lys	Leu	Asn		
			965						970					975			
Asn	Leu	Ile	Trp	Val	Trp	Asn	Ser	Val	Ala	Pro	Asp	Trp	Tyr	Pro	Gly		
			980					985					990				
Asp	Glu	Tyr	Val	Asp	Ile	Leu	Ser	Phe	Asp	Ser	Tyr	Pro	Gln	Ala	Gly		
		995					1000					1005					
Asp	Tyr	Ser	Pro	Gln	Ile	Ala	Lys	Tyr	Glu	Asp	Leu	Val	Thr	Leu	Gly		
	1010					1015					1020						

Lys Asp Lys Lys Leu Val Cys His Glu Arg Lys Arg Thr Tyr Pro Gly
 1025 1030 1035 1040
 Pro Gly Ser Asp Glu Gly Val Ser Ser Pro Leu Glu Leu Val Arg Tyr
 1045 1050 1055
 Met Val Trp Gly Phe Leu Glu Arg Arg Gln Thr Lys Gln Ser Leu Glu
 1060 1065 1070
 His Leu Lys Lys Val Tyr Asn His Pro Asn Val Ile Thr Leu Glu Lys
 1075 1080 1085
 Leu Pro Thr Asn Leu Lys Thr Tyr Gly Ile Thr Glu Gln Pro Ser Val
 1090 1095 1100
 Pro Gly Ser Phe Thr Leu Asn Ala Ala Gly Glu Thr Ala Lys Val Lys
 1105 1110 1115 1120
 Leu Ser Trp Thr Ala Ser Ala Asn Ala Ala Ser Tyr Glu Val Lys Arg
 1125 1130 1135
 Ser Thr Val Glu Asn Gly Ala Phe Ala Thr Val Ala Ser Asp Val Tyr
 1140 1145 1150
 Gly Ser Ser Tyr Thr Asp Thr Ala Val Thr Ala Asp Thr Thr Tyr Tyr
 1155 1160 1165
 Tyr Gln Val Val Ala Lys Asn Asp Ala Gly Gln Thr Val Ser Asn Thr
 1170 1175 1180
 Ala Ser Ala Ala Pro Lys Ala Asp Thr Gln Gln Pro Thr Thr Gly Leu
 1185 1190 1195 1200
 Val Leu Gln Tyr Arg Thr Ala Asp Thr Asn Val Asn Asp Asn His Leu
 1205 1210 1215
 Asn Pro His Phe Gln Ile Leu Asn Lys Gly Thr Ile Ser Val Pro Ile
 1220 1225 1230
 Asn Glu Leu Lys Ile Arg Tyr Tyr Thr Thr Ile Asp Gly Asp Arg Glu
 1235 1240 1245
 Gln Thr Phe Asn Cys Asp Tyr Ala Val Leu Ser Cys Ser Lys Leu Asn
 1250 1255 1260
 Gly Lys Leu Val Lys Met Asp Lys Ala Ala Thr Gly Ala Asp Tyr Tyr
 1265 1270 1275 1280
 Leu Glu Val Ser Phe Asn Ser Asp Ala Gly Val Leu Ala Ser Gly Gly
 1285 1290 1295
 Ser Thr Gly Gly Ile Gln Thr Arg Ile His Lys Ala Asp Trp Ser Asn
 1300 1305 1310
 Tyr Asn Glu Ser Asp Asp Tyr Ser Tyr Lys Gly Thr Gln Thr Ser Phe
 1315 1320 1325

Asp Asp His Thr Lys Ala Thr Leu Tyr His Asn Gly Val Leu Val Trp
 1330 1335 1340

Gly Thr Glu Thr Ala Asn
 1345 1350

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 <213> Paenibacillus pabuli

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 ggaacttctg taaaaggcaa ctatagctgg ttcgtggact attacctgga tcaaattgcgc 900
 ctcaactcgc aagccgaagg caagagattg ctggatgtat tcgatgtgca ctggtatccc 960
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<400> 6

Met	Lys	Ala	Lys	Asn	Ser	Ser	Asn	Ile	Leu	Ser	Lys	Arg	Ser	Lys	Trp	1	5	10	15
Leu	Pro	Val	Val	Met	Ala	Cys	Thr	Ile	Ile	Val	Gly	Gly	Ala	Leu	Pro	20	25	30	
Ala	Pro	Thr	Val	Val	His	Gly	Gln	Thr	Ala	Lys	Thr	Val	Thr	Ile	Lys	35	40	45	
Val	Asp	Thr	Ser	Lys	Asp	Arg	Lys	Pro	Ile	Ser	Pro	Tyr	Ile	Tyr	Gly	50	55	60	
Thr	Asn	Gln	Asp	Leu	Ala	Gly	Asp	Glu	Asn	Leu	Ala	Ala	Arg	Arg	Leu	65	70	75	80
Gly	Gly	Asn	Arg	Met	Thr	Gly	Tyr	Asn	Trp	Glu	Asn	Asn	Met	Ser	Asn	85	90	95	
Ala	Gly	Ser	Asp	Trp	Gln	Gln	Ser	Ser	Asp	Asn	Phe	Leu	Cys	Asn	Asn	100	105	110	
Gly	Gly	Leu	Thr	Lys	Ala	Glu	Cys	Glu	Lys	Pro	Gly	Ala	Val	Thr	Thr	115	120	125	
Ser	Phe	His	Asp	Gln	Ser	Leu	Lys	Leu	Gly	Ala	Tyr	Ser	Leu	Val	Thr	130	135	140	
Leu	Pro	Met	Ala	Gly	Tyr	Val	Ala	Lys	Asp	Gly	Asn	Gly	Ser	Val	Gln	145	150	155	160
Glu	Ser	Glu	Gln	Ala	Pro	Ser	Ala	Arg	Trp	Asn	Gln	Val	Val	Asn	Ala	165	170	175	
Lys	Asn	Ala	Pro	Phe	Gln	Leu	Gln	Pro	Asp	Leu	Asn	Asp	Asn	Gln	Val	180	185	190	
Tyr	Ala	Asp	Glu	Phe	Val	Asn	Phe	Leu	Val	Lys	Lys	Tyr	Gly	Ala	Ala	195	200	205	
Ser	Thr	Lys	Ala	Gly	Val	Lys	Gly	Tyr	Ala	Leu	Asp	Asn	Glu	Pro	Ala	210	215	220	
Leu	Trp	Ser	His	Thr	His	Pro	Arg	Ile	His	Gly	Glu	Lys	Val	Xaa	Xaa	225	230	235	240
Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	245	250	255	
Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	260	265	270	
Xaa	Xaa	Phe	Lys	Leu	His	Xaa	Ile	Gly	Thr	Ser	Val	Lys	Gly	Asn	Tyr	275	280	285	
Ser	Trp	Phe	Val	Asp	Tyr	Tyr	Leu	Asp	Gln	Met	Arg	Leu	Asn	Ser	Gln	290	295	300	

Ala Glu Gly Lys Arg Leu Leu Asp Val Phe Asp Val His Trp Tyr Pro
 305 310 315 320
 Glu Ala Met Gly Gly Gly Ile Arg Ile Thr Asn Glu Val Gly Asn Asp
 325 330 335
 Glu Thr Lys Lys Ala Arg Met Gln Ala Pro Arg Thr Leu Trp Asp Pro
 340 345 350
 Thr Tyr Lys Glu Asp Ser Trp Ile Ala Gln Trp Asn Ser Ala Phe Leu
 355 360 365
 Pro Leu Leu Pro Arg Leu Lys Gln Ser Val Asp Lys Tyr Tyr Pro Gly
 370 375 380
 Thr Lys Leu Ala Leu Thr Glu Tyr Ser Tyr Gly Gly Glu Asn Asp Ile
 385 390 395 400
 Ser Gly Gly Ile Ala Met Thr Asp Val Leu Gly Ile Leu Gly Lys Asn
 405 410 415
 Asp Val Tyr Met Ala Asn Tyr Trp Lys Leu Lys Asp Gly Ala Asn Asn
 420 425 430
 Tyr Val Ser Ala Ala Tyr Lys Leu Tyr Arg Asn Tyr Asp Gly Lys Asn
 435 440 445
 Ala Thr Phe Gly Asp Ile Ser Val Asn Ala Gln Thr Ser Asp Ile Val
 450 455 460
 Asn Ser Ser Val His Ala Ser Val Thr Asp Ala Ser Tyr Lys Glu Leu
 465 470 475 480
 His Leu Ile Val Met Asn Lys Ser Met Asp Ser Ala Phe Asp Ala Gln
 485 490 495
 Phe Asp Leu Ser Gly Glu Thr Thr Tyr Ser Ser Gly Lys Ile Trp Gly
 500 505 510
 Phe Asp Lys Asn Ser Ser Gln Ile Lys Ala Val Ala Pro Ile Thr Gln
 515 520 525
 Ile Ser Gly Asn Arg Phe Thr Tyr Thr Val Pro Pro Leu Thr Ala Tyr
 530 535 540
 His Ile Val Leu Thr Ala Asp Asn Asp Thr Pro Val Pro Pro Val Glu
 545 550 555 560
 Asp Pro Glu Ser Phe Thr Leu Arg Ala Glu Ala Gly Asp Gly Lys Val
 565 570 575
 Asp Leu Ser Trp Asp Ala Ser Ser Gly Val Val Gly Tyr Ser Val Gln
 580 585 590
 Arg Ala Thr Tyr Glu Asn Gly Pro Phe Ala Ala Val Ala Ser Asn Leu
 595 600 605

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